

## Appendix D

### SELECT PETROLEUM ENGINEERING AND ECONOMIC DATA USED TO ASSESS UNDISCOVERED ECONOMICALLY RECOVERABLE RESOURCES

This appendix presents select petroleum engineering and economic data and information used to develop estimates of the volume of undiscovered economically recoverable oil and gas resources in 13 assessment areas of the Pacific OCS Region. The data are presented in tabular format by area. The following describes the categories and types of data presented. Multiple values (minimum, most probable, and maximum) are presented for parameters that are described by a probability distribution. A single value (most probable) is presented for parameters that are described by a constant.

#### Exploration Parameters

*These parameters are used to estimate exploration costs.*

Exploratory Wells:	the number of wells drilled to discover a field in the area
Delineation Wells:	the number of wells drilled to delineate a field in the area
E & D Well Drilling Depth:	the measured depth of exploratory and delineation (E & D) wells in the area, expressed in feet
E & D Well Drilling Time:	the period of time to drill an exploratory or delineation well, expressed in months per well

#### Development Parameters

*These parameters are used to estimate development costs.*

Platform Size:	the range of platform sizes in the area, expressed as the number of well slots
Water Depth:	the water depth at platforms, expressed in feet
Production Well Depth:	the total measured depth of production wells, expressed in feet

#### Oil Production Parameters

*These parameters are used to estimate the production profile of a well using common reservoir engineering methods.*

Oil Well Recovery:	the total volume of crude oil produced from a well in the area, expressed in million barrels per well
Initial Oil Rate:	the initial rate of crude oil production from a well, expressed in barrels per day per well
Oil Produced Before Decline:	the fraction of the total volume of crude oil produced from a well that is produced before the initial production rate declines, expressed as a decimal fraction
Initial Oil Decline Rate:	the rate at which crude oil production declines at the onset of decline, expressed as a decimal fraction per year
Hyperbolic Decline Coefficient:	an exponential coefficient used to describe the shape of an oil production decline curve that is defined by a hyperbolic function (zero indicates an exponential decline and one indicates a harmonic decline)

### Gas Production Parameters

*These parameters are used to estimate the production profile of a well using common reservoir engineering methods.*

Gas-to-Oil Proportion:	the proportional volume of gas (including associated and nonassociated gas) that can be extracted from the area relative to the volume of crude oil that can be extracted from the area, expressed in cubic feet per barrel
Initial Gas Rate:	the initial rate of gas production from a well, expressed in thousand cubic feet per day per well
Gas Produced Before Decline:	the fraction of the total volume of gas produced from a well that is produced before the initial production rate declines, expressed as a decimal fraction
Initial Gas Decline Rate:	the rate at which gas production declines at the onset of decline, expressed as a decimal fraction per year
Hyperbolic Decline Coefficient:	an exponential coefficient used to describe the shape of a gas production decline curve that is defined by a hyperbolic function (zero indicates an exponential decline and one indicates a harmonic decline)

### Pipeline Network Parameters

*These parameters are used to determine the size of the oil and gas pipeline network at field and area levels to estimate pipeline costs.*

Trunkline Length	the estimated total length of trunk pipeline(s) to develop the area, expressed in miles
Branchline Length:	the estimated length of pipelines that branch from a trunkline to a platform, expressed in miles

### Economic Parameters

*These parameters are used to model the economic viability of developing the oil and gas resources of the area. Rates are expected average values during the period of development and production in the area. The oil price adjustment is used to normalize differences in price due to differences of oil gravity among areas.*

Interest Rate:	the private after-tax discount rate, expressed as a percent
Inflation Rate:	the inflation rate, expressed as a percent
Royalty Rate:	the royalty rate, expressed as a percent
Tax Rate:	the Federal corporate tax rate, expressed as a percent
Oil Price Adjustment:	the adjustment of the price of crude oil produced from the area compared to an assumed price (\$18 per bbl of 32 °API crude oil), based on the expected gravity of the oil, expressed as an increased (+) or decreased (-) value in dollars per barrel

### Washington-Oregon Area

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		3	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		12,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	100	300	500
Production Well Depth (feet)	3,200	7,700	20,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		1.6 to 2.0	
Initial Oil Rate (bbl per day per well)		700	
Oil Produced Before Decline (fraction)	0.15	0.175	0.20
Initial Oil Decline Rate (fraction per year)	0.15	0.20	0.25
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		N/A	
Initial Gas Rate (Mcf per day per well)		100,000	
Gas Produced Before Decline (fraction)		0.22	
Initial Gas Decline Rate (fraction per year)		0.22	
Gas Hyperbolic Decline Coefficient		0.50	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		80	
Branchline Length (miles)		35	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		+ 0.40	

### Eel River Basin

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		9,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	200	600	1,200
Production Well Depth (feet)	6,000	7,700	17,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		1.6 to 2.0	
Initial Oil Rate (bbl per day per well)		700	
Oil Produced Before Decline (fraction)	0.15	0.175	0.20
Initial Oil Decline Rate (fraction per year)	0.15	0.20	0.25
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		N/A	
Initial Gas Rate (Mcf per day per well)		100,000	
Gas Produced Before Decline (fraction)		0.22	
Initial Gas Decline Rate (fraction per year)		0.22	
Gas Hyperbolic Decline Coefficient		0.50	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		15	
Branchline Length (miles)		20	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		+ 0.40	

**Point Arena Basin**

<b>Exploration Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		10,000	
E & D Well Drilling Time (months per well)		2	
<b>Development Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	350		3,250
Production Well Depth (feet)	4,000	10,000	25,000
<b>Oil Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		3.5 to 4.0	
Initial Oil Rate (bbl per day per well)		1,250	
Oil Produced Before Decline (fraction)	0.15	0.175	0.20
Initial Oil Decline Rate (fraction per year)		0.15	
Oil Hyperbolic Decline Coefficient		0.30	
<b>Gas Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,060	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
<b>Transportation and Pipeline Network Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		20	
Branchline Length (miles)		15	
<b>Economic Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		12.5	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 1.60	

**Bodega Basin**

<b>Exploration Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		7,500	
E & D Well Drilling Time (months per well)		2	
<b>Development Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	100	350	750
Production Well Depth (feet)	5,000	10,000	19,000
<b>Oil Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		3.4 to 3.8	
Initial Oil Rate (bbl per day per well)		1,250	
Oil Produced Before Decline (fraction)	0.15	0.175	0.20
Initial Oil Decline Rate (fraction per year)		0.15	
Oil Hyperbolic Decline Coefficient		0.30	
<b>Gas Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,100	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
<b>Transportation and Pipeline Network Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		12	
Branchline Length (miles)		15	
<b>Economic Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 1.35	

### Año Nuevo Basin

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		8,300	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	225	350	1,250
Production Well Depth (feet)	5,000	10,000	19,500
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		3.5 to 3.9	
Initial Oil Rate (bbl per day per well)		1,250	
Oil Produced Before Decline (fraction)	0.15	0.175	0.20
Initial Oil Decline Rate (fraction per year)		0.15	
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,080	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		7.5	
Branchline Length (miles)		15	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 1.65	

### Santa Maria-Partington Basin

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		12,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	200		2,300
Production Well Depth (feet)	6,000	10,000	14,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		3.0 to 4.0	
Initial Oil Rate (bbl per day per well)		1,250	
Oil Produced Before Decline (fraction)	0.15	0.175	0.20
Initial Oil Decline Rate (fraction per year)		0.15	
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		940	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		30	
Branchline Length (miles)		20	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 2.10	

**Santa Barbara-Ventura Basin**

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		1	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		14,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	100	600	1,650
Production Well Depth (feet)	5,000	10,500	23,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		2.5 to 3.0	
Initial Oil Rate (bbl per day per well)		1,300	
Oil Produced Before Decline (fraction)	0.20	0.225	0.25
Initial Oil Decline Rate (fraction per year)		0.20	
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		2,500	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		0	
Branchline Length (miles)		7	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 1.05	

**Los Angeles Basin**

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		10,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	200	750	1,700
Production Well Depth (feet)	5,000	10,000	19,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		2.6	
Initial Oil Rate (bbl per day per well)		1,200	
Oil Produced Before Decline (fraction)	0.20	0.225	0.25
Initial Oil Decline Rate (fraction per year)	0.20	0.225	0.25
Oil Hyperbolic Decline Coefficient		N/A	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,020	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		5	
Branchline Length (miles)		5	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 0.75	

### Santa Monica-San Pedro Area

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		2	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		7,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	200	1,750	2,850
Production Well Depth (feet)	7,000	11,000	18,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		2.52 to 3.15	
Initial Oil Rate (bbl per day per well)		1,300	
Oil Produced Before Decline (fraction)	0.20	0.225	0.25
Initial Oil Decline Rate (fraction per year)		0.15	
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,130	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		15	
Branchline Length (miles)		6	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 0.90	

### Oceanside-Capistrano Basin

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		3	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		11,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	300	1,000	2,000
Production Well Depth (feet)	7,500	11,000	24,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		2.3 to 2.5	
Initial Oil Rate (bbl per day per well)		1,100	
Oil Produced Before Decline (fraction)	0.20	0.23	0.25
Initial Oil Decline Rate (fraction per year)	0.15	0.175	0.225
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,170	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		21	
Branchline Length (miles)		5	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		16.67	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 1.20	

**Santa Cruz-Santa Rosa Area**

<b>Exploration Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		3	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		13,000	
E & D Well Drilling Time (months per well)		2	
<b>Development Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	1,500	4,000	5,000
Production Well Depth (feet)	6,200	11,000	22,000
<b>Oil Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		2.5 to 2.75	
Initial Oil Rate (bbl per day per well)		800	
Oil Produced Before Decline (fraction)		0.15	
Initial Oil Decline Rate (fraction per year)	0.15	0.20	0.25
Oil Hyperbolic Decline Coefficient		0.30	
<b>Gas Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,790	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
<b>Transportation and Pipeline Network Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		40	
Branchline Length (miles)		16	
<b>Economic Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		12.5	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 0.60	

**San Nicolas Basin**

<b>Exploration Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		3	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		13,000	
E & D Well Drilling Time (months per well)		2	
<b>Development Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	2,500	4,000	5,000
Production Well Depth (feet)	8,000	10,500	23,000
<b>Oil Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		2.2 to 2.4	
Initial Oil Rate (bbl per day per well)		1,050	
Oil Produced Before Decline (fraction)		0.23	0.25
Initial Oil Decline Rate (fraction per year)	0.20	0.20	0.25
Oil Hyperbolic Decline Coefficient	0.15	0.30	
<b>Gas Production Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		1,670	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
<b>Transportation and Pipeline Network Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		75	
Branchline Length (miles)		12	
<b>Economic Parameters</b>			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		12.5	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		- 0.60	



## Cortes-Velero-Long Area

Exploration Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Exploratory Wells		3	
Delineation Wells		2	
E & D Well Drilling Depth (feet)		14,000	
E & D Well Drilling Time (months per well)		2	
Development Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Platform Size (slots)	18		60
Water Depth (feet)	3,000	4,500	6,000
Production Well Depth (feet)	8,500	11,800	23,000
Oil Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Oil Well Recovery (MMbbl per well)		0.80	
Initial Oil Rate (bbl per day per well)		550	
Oil Produced Before Decline (fraction)		0.25	
Initial Oil Decline Rate (fraction per year)	0.15	0.20	0.25
Oil Hyperbolic Decline Coefficient		0.30	
Gas Production Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Gas-to-Oil Proportion (cf per bbl)		2,670	
Initial Gas Rate (Mcf per day per well)		N/A	
Gas Produced Before Decline (fraction)		N/A	
Initial Gas Decline Rate (fraction per year)		N/A	
Gas Hyperbolic Decline Coefficient		N/A	
Transportation and Pipeline Network Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Trunkline Length (miles)		75	
Branchline Length (miles)		35	
Economic Parameters			
	<u>Minimum</u>	<u>Most Probable</u>	<u>Maximum</u>
Interest Rate (percent)		12.0	
Inflation Rate (percent)		3.0	
Royalty Rate (percent)		12.5	
Tax Rate (percent)		35.0	
Oil Price Adjustment (dollars per bbl)		0.00	